

MULTIMEDIA



UNIVERSITY

TABLE NO

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STUDENT ID NO

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SUBJECT CODE \_\_\_\_\_

# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 2, 2016/2017

### TSE3351/TSE3571 – SOFTWARE EVOLUTION AND MAINTENANCE ( All sections / Groups )

8 MARCH 2017  
2:30 pm – 4:30 pm  
( 2 Hours )

Examiner 1 Signature: \_\_\_\_\_

Examiner 2 Signature: \_\_\_\_\_

Examiner 3 Signature: \_\_\_\_\_

Question	Mark
A	
B	
C	
D	
Total	

#### INSTRUCTIONS TO STUDENTS

1. This question paper consists of 10 printed pages (including cover page) with 4 Sections only.
2. Attempt **ALL** questions in **SECTION A, SECTION B, SECTION C and SECTION D**. The distribution of the marks for each question is given.
3. Please write all your answers **CLEARLY** in the specific answer box provided for each question. Submit this question paper at the end of the examination.

**Attempt ALL questions in SECTION A, B, C and D.**

**Section A (12.5 marks)**

A1. How does a process of software evolution work?

**(1 mark)**

A2. What does software maintenance concerned with? Explain TWO reasons why is software maintenance important?

**(1.5 + 2 marks)**

A3. If a system is used, it is never finished because it will always need to evolve. Why?

**(1 mark)**

**Continued...**

A4. What are the THREE components that define software as proposed by McDermid? For each component, provide at least TWO examples.

**(3 marks)**

A5. Explain FOUR factors (with at least an example for each factor) that provide the motivation for software maintenance.

**(4 marks)**

**Continued...**

**Section B (12.5 marks)**

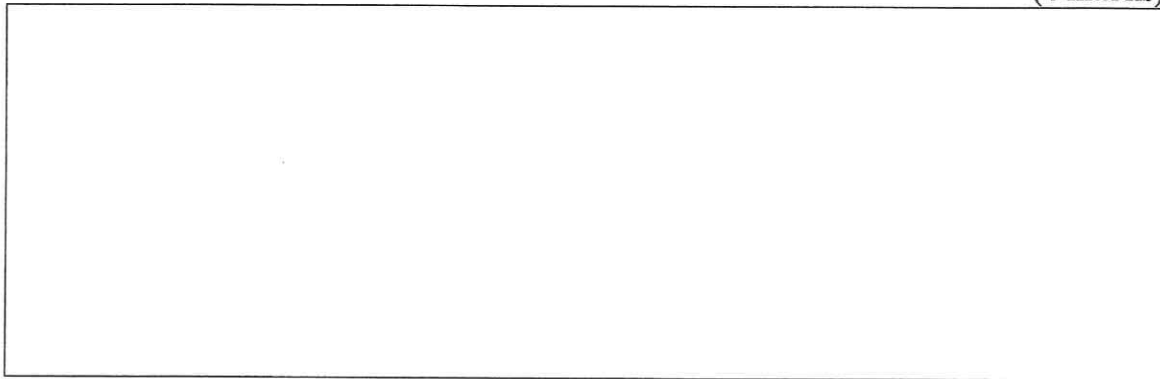
The Sol system deploys many inexpensive network-connected sensors. The solution works by aggregating distributed data from each sensor into a cloud-based database. Subscribers to the data can use visualization and analytics to monitor and react to current conditions as well as predict future energy production.

Solar information collected from the sensors is formatted as JavaScript Object Notation files and stored in an IBM Cloudant database. Cloudant is a document-based NoSQL database, founded on the Apache CouchDB project. Its design allows scalability through the use of clustering and automatic data rebalancing. IBM's Bluemix cloud application platform offers Cloudant as a service. The Sol system focuses on the ability to capture and analyze large amounts of solar raw data. Its success will rely on the deployment of a large number of network-connected sensors.

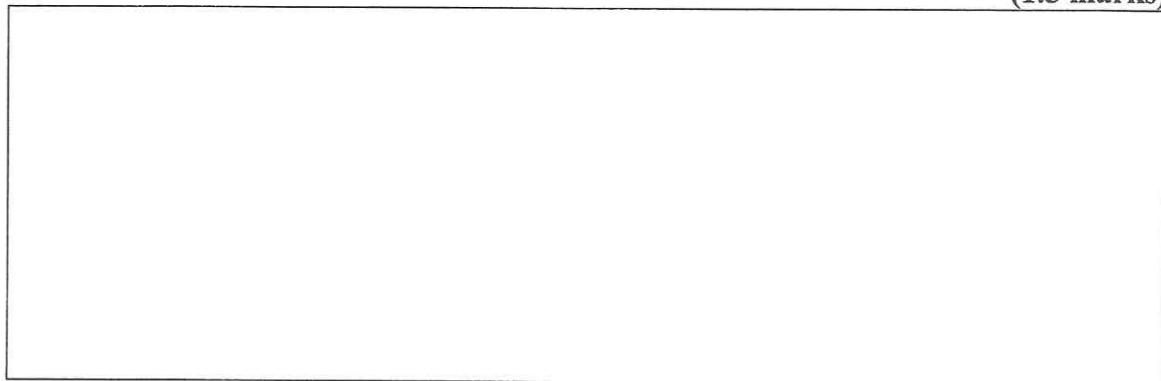
Based on the above scenario, answer the following questions Q-B1 to Q-B4:

B1. Explain TWO reasons why configuration management in software development differs from configuration management in software maintenance for the abovementioned Sol system.

**(4 marks)**



B2. What are the THREE main responsibilities of the management in Sol change control?  
**(1.5 marks)**



**Continued...**

B3. What comprises a good test plan for an assessment using Sol system? Explain FOUR ways how a good test plan facilitates testing for the Sol system.

**(1 + 4 marks)**

B4. Explain TWO factors that prevent organization to undertake domain analysis in using a novel approach such as IBM Bluemix platform?

**(2 marks)**

**Continued...**

**Section C (12.5 marks)**

C1. Describe Osborne's maintenance process model. Next, explain the Boehm's management decisions model.

**(2.5 + 2.5 marks)**

**Continued...**

C2. To achieve the objectives of maintenance, a wide spectrum of change to the software product may be necessary. There are four types of software change. Define each of the following software change.

C2a. Corrective change.

**(0.5 marks)**

C2b. Adaptive change.

**(0.5 marks)**

C2c. Perfective change.

**(0.5 marks)**

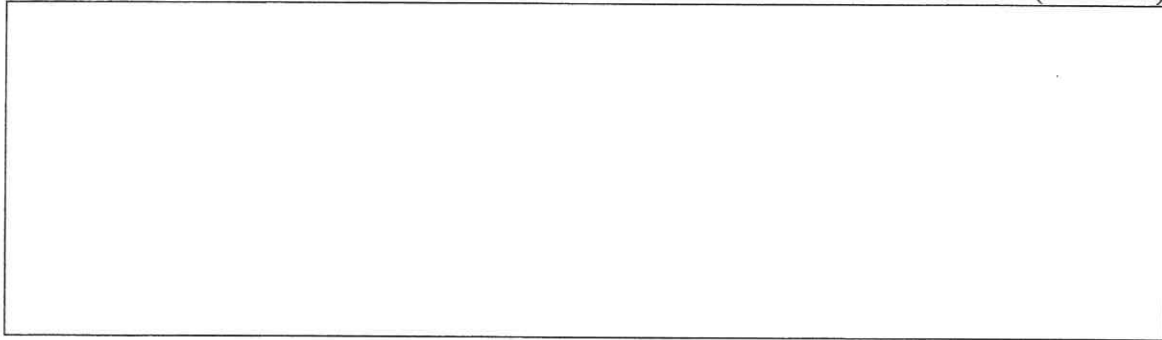
C2d. Preventive change.

**(1 mark)**

**Continued .....**

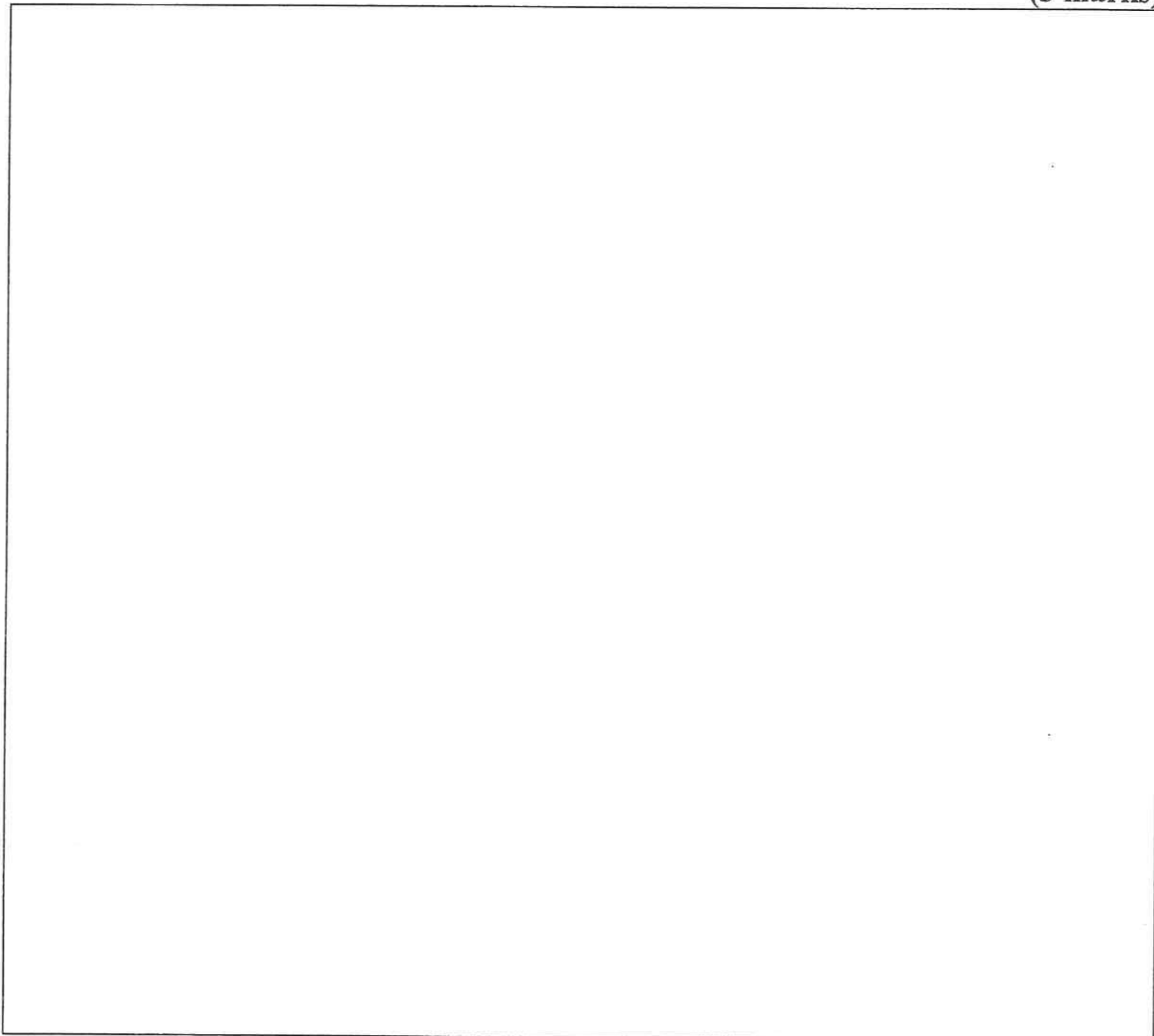
C3. Explain why it is important to categorize software changes.

**(2 marks)**



C4. Draw a diagram to show the potential relationships between the different types of software changes as mentioned in Question C2 above.

**(3 marks)**



**Continued...**



**Section D (12.5 marks)**

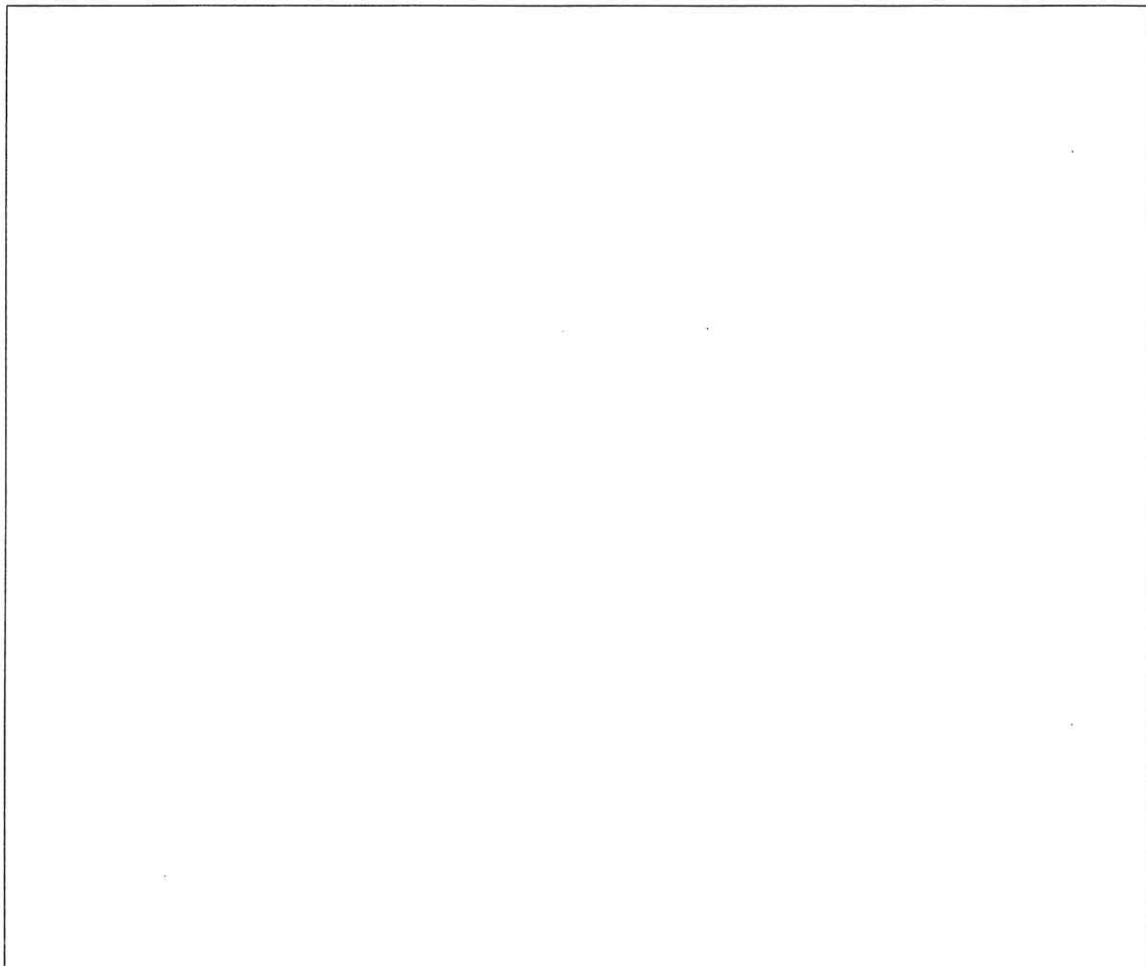
To improve software maintenance tools, there are two dimensions of usefulness for human-centered methods: that an important problem is addressed and that the problem is actually solved. For a problem to be important, it must happen frequently or have a large impact and be difficult for the developer to solve (which might be measured by the effort or time that solving it takes).

The frequency, impact, and difficulty can all be measured with the HCI (Human Computer Interaction) methods. Surveys have shown that developers complain that researchers sometimes address unimportant problems. Researchers can avoid this by using human-centered data to help decide which problems to research.

Based on the above scenario, answer the following questions Q-D1 to Q-D4:

D1. Explain the FIVE guidelines in producing good software tools documentation.

**(5 marks)**



**Continued...**

D2. Software measurement is a process to quantify an attribute of a software tool and process. List at least FIVE examples that we can measure the software tool.

**(2.5 marks)**

D3. Explain FOUR difficulties that you would expect in the context of software reuse.

**(2 marks)**

D4. Provide SIX benefits that can be derived from software reuse.

**(3 marks)**

**End of Paper**